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CLAIMS

We claim:

- 5 1. A drive track unit for a track-driven all-terrain vehicle, the drive track unit including:
 - a track unit frame including a carrier beam extending longitudinally of the track unit;
 - plural guide wheel assemblies rotatably mounted on said carrier beam;
- 10 a drive wheel assembly rotatably supported on said frame;
- an endless drive track trained about said guide wheel assemblies and the drive wheel assembly;
- a drive axle drivingly connected at one end portion to said drive wheel assembly for rotating the assembly and adapted for connection to a power source on a vehicle;
- 15 said multiple guide wheel assemblies and said drive wheel assembly supporting said endless track in a generally triangular configuration with the drive wheel assembly at the apex of said configuration and said guide wheel assemblies spaced apart along the base of the configuration so that the track defines a terrain-engaging lower track run;
- said guide wheel assemblies each including multiple guide wheel units, with at least one said guide wheel unit mounted on each of the opposite sides of said carrier beam;
- 20 said endless track having a track width defined by inner and outer track reaches extending laterally inwardly and outwardly beyond the carrier beam and terminating at inner and outer track edges;
- 25 each said guide wheel unit of a guide wheel assembly including a track support surface engaging and supporting said endless track such that the track support surfaces of a guide wheel assembly support substantially the full width of the drive track.

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2. A drive track unit according to claim 1 wherein the drive track comprises an elastomer drive belt having circumferentially spaced apart drive lugs extending inwardly from an inner surface of the belt and arranged in multiple circumferentially extending rows, said drive wheel assembly including a sprocket wheel means including 5 cogs for drivingly engaging the lugs in each of said rows.

3. A drive track unit according to claim 2 wherein the multiple rows of lugs include at least three rows of lugs and said sprocket wheel means includes at least two sprocket wheels, each with its cogs arranged to drivingly engage at least two of said 10 rows of lugs.

4. A drive track unit according to claim 2 wherein said drive belt has a smooth outer surface to minimize terrain disturbance.

15 5. A drive track unit according to claim 3 wherein said drive wheel assembly includes a unitary one-piece axle hub and sprocket drum directly and drivingly connected to said drive axle and to both said sprocket wheels.

20 6. A drive track unit according to claim 2 wherein said track support surfaces of said guide wheel units of a guide wheel assembly engage the inner surface of said drive belt across substantially the full width of said belt except in regions of said inner belt surface interrupted by said rows of drive lugs.

25 7. A drive track unit according to claim 2 wherein each said guide wheel unit of a guide wheel assembly includes laterally spaced apart outer and inner track support surface portions for engaging and supporting said drive belt, said surface portions of a wheel unit being separated by a circumferential groove for receiving and allowing passage of a row of said lugs.

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8. A drive track unit according to claim 7 wherein the outer surface portion of each said guide wheel unit is substantially wider than the inner surface portion thereof and extends laterally to a position adjacent one of said edges of said drive belt.

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9. A drive track unit according to claim 6 wherein each said guide wheel unit of a guide wheel assembly includes laterally spaced apart outer and inner track support surface portions for engaging and supporting the drive belt, said surface portions of a wheel unit being separated by a circumferential groove for receiving and allowing passage of a row of said lugs, and said outer surface portion being substantially wider than said inner surface portion and extending laterally to a position adjacent one of said edges of said belt.

10. A drive track unit according to claim 5 wherein each said guide wheel unit of a guide wheel assembly includes laterally spaced apart outer and inner track support surface portions for engaging and supporting the drive belt, said support surface portions of a wheel unit being separated by a circumferential groove for receiving and allowing passage of a row of said lugs, and said outer support surface portion being substantially wider than said inner support surface portion and extending outwardly to a position adjacent to the outer edge of said belt.

11. A drive track unit according to claim 2 wherein said inner and outer track reaches of said drive belt terminate respectively at said inner and outer track edges laterally inwardly and outwardly beyond the inner and outer limits of said track support surfaces.

12. A drive track unit according to claim 11 wherein said drive lugs are arranged in three said rows, including an outer row positioned to be restrained against

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lateral movement by a first said guide-wheel unit of a guide wheel assembly, an inner row positioned to be restrained against lateral movement by a second guide wheel unit of said guide wheel assembly, and a middle row positioned between said first and second guide wheel units, the lugs of said middle row having a width such that said
5 middle row is restrained against lateral movement by both of said first and second guide wheel units.

13. A drive track unit according to claim 2 wherein said drive lugs are arranged in three said rows, including an outer row positioned to be restrained against
10 lateral movement by a first said guide-wheel unit of a guide wheel assembly, an inner row positioned to be restrained against lateral movement by a second guide wheel unit of said guide wheel assembly, and a middle row positioned between said first and second guide wheel units, the lugs of said middle row having a width such that said middle row is restrained against lateral movement by both of said first and second guide
15 wheel units.

14. A drive track unit according to claim 13 wherein the lugs in said middle row are substantially wider than the lugs in said outer and inner rows.

20 15. A drive track unit according to claim 11 wherein said cogs are sized and arranged to drivingly engage simultaneously the full width of a lug in each of said rows.

16. A drive track unit according to claim 2 wherein said cogs are sized and arranged to drivingly engage simultaneously the full width of a lug in each of said rows.

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17. A drive track unit according to claim 13 wherein said cogs are sized and arranged to drivingly engage simultaneously the full width of a lug in each of said rows.

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18. A drive track unit according to claim 14 wherein said cogs are sized and arranged to drivingly engage simultaneously the full width of a lug in each of said rows.

19. A drive track unit for a track-driven all-terrain vehicle, the track unit
5 comprising:

a track frame including a carrier beam extending longitudinally of the frame;

a rotatable track drive wheel assembly supported on said frame;

plural guide wheel assemblies mounted on said carrier beam and in spaced apart relationship along said beam;

10 an endless drive track trained about said drive wheel assembly and said guide wheel assemblies and being drivingly engaged by the drive wheel assembly and supported during ground engagement by said guide wheel assemblies; and

each said guide wheel assembly including a wheel spindle fixedly mounted to said carrier beam and extending laterally outwardly and inwardly beyond said beam, and a pair of guide wheel units rotatably mounted on said spindle, including an outer guide wheel unit mounted outwardly of said beam and an inner guide wheel unit mounted inwardly of said beam, such that the outer and inner guide wheel units are axially spaced apart on opposite sides of said beam and define the width of the guide wheel assembly.

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20. A drive track unit according to claim 19 wherein said endless track has a track width extending at least the full width of said guide wheel assembly.

21. A drive track unit according to claim 19 wherein said guide wheel
25 assembly has a width that extends substantially the full width of said endless drive track.

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22. A drive track unit according to claim 19 wherein all said guide wheel assemblies engaging a ground-engaging portion of the endless track are identical.

23. A drive track unit according to claim 21 wherein all guide wheel
5 assemblies engaging a ground-engaging portion of the endless track are of identical construction.

24. A drive track unit according to claim 19 wherein the inner and outer guide wheel units of a said guide wheel assembly are identical in size and construction.

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25. A drive track unit according to claim 19 wherein each said inner and outer guide wheel unit of a guide wheel assembly includes an outer guide wheel portion and an inner guide wheel portion carried by a common guide wheel hub rotatably mounted on said spindle, said outer and inner guide wheel portions each including a
15 track-engaging surface, said track-engaging surface of said outer guide wheel portion being substantially wider than the track-engaging surface of said inner guide wheel portion, and the guide wheel surfaces of said inner and outer guide wheel portions being separated by an annular groove.

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26. A drive track unit according to claim 25 wherein the track-engaging surface of said outer guide wheel portion extends to substantially an edge portion of the endless track.

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27. A drive track unit according to claim 19 wherein the endless drive track comprises an elastomer belt having a smooth outer ground-engaging surface and an inner surface including multiple laterally spaced-apart rows of inwardly extending and longitudinally spaced-apart drive lugs.

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28. A drive track unit according to claim 27 wherein each said guide wheel unit includes an outer belt-engaging surface, said surface being subdivided by an annular groove into a wide outer surface portion and a narrower inner surface portion, said groove being sized and positioned to enable a row of said lugs to pass therethrough
5 when said belt-engaging surface engages the inner surface of said belt.

29. A drive track unit according to claim 28 wherein said belt includes at least one row of drive lugs positioned between and extending into the space defined by the separation between said outer and inner guide wheel units of a guide wheel
10 assembly, such that said at least one row of drive lugs passes between said outer and inner guide wheel units of said assembly.

30. A drive track unit according to 29 wherein said belt-engaging surfaces of said inner and outer guide wheel units of a guide wheel assembly engage and support
15 substantially the entire width of said endless belt except in spaces defined by said annular grooves and by the separation between said guide wheel units of said assembly.

31. A drive track unit according to claim 26 including a drive axle and wherein said drive wheel assembly comprises a pair of axially spaced apart drive
20 sprocket wheels mounted on a central one-piece sprocket drum and hub, the drive sprocket wheels being drivingly connected directly to opposite end portions of said drum and hub, and the drum and hub being drivingly connected directly to said drive axle, each drive sprocket wheel including circumferentially spaced apart drive cogs extending laterally from opposite sides of the sprocket wheel to drivingly engage said
25 drive lugs of multiple said rows of lugs.

32. A drive track unit according to claim 31 wherein the belt includes at least three said rows of lugs including one said row aligned with said annular groove of each

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said guide wheel unit and another said row aligned with and extending into the spacing between said pair of guide wheel units of a guide wheel assembly.

33. A drive track unit according to claim 29 wherein said at least one row of
5 drive lugs comprises a single row of said drive lugs.

34. A drive track unit according to claim 33 wherein the drive lugs of said single row extend substantially the full width of said space between said outer and inner guide wheel units.

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35. A drive track unit according to claim 20 wherein said track width is greater than the full width of said guide wheel assembly.

36. A drive track unit according to claim 31 wherein each drive cog is sized
15 to drivingly engage the full width of each drive lug in a row of said lugs.

37. A drive track unit according to claim 32 wherein a single said row of lugs extends into said spacing, the lugs of said single row having a width that substantially fills said spacing, and said drive cogs of said pair of sprocket wheels
20 including cog portions that drivingly engage substantially the full width of the lugs of said single row.

38. A drive wheel assembly for driving an endless drive track on a drive track unit of an all-terrain vehicle, said drive wheel assembly comprising:
25 first and second drive sprocket wheels, each including plural circumferentially spaced apart and laterally extending drive cogs for drivingly engaging drive lugs on an inner surface of the endless track;

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a sprocket drum mounting said sprocket wheels in axially spaced apart relationship at opposite end portions of the drum;

an axle hub adapted for direct connection to a powered drive axle of the drive track unit; and

5 said sprocket drum and axle hub being integrated into a single, one-piece unit.

39. A drive wheel assembly according to claim 38 wherein said one-piece unit includes a central tubular body portion adapted for rotatable mounting on an axle tube surrounding the axle shaft, and axially spaced apart first and second flange portions 10 extending generally radially from said body portion and being drivingly connected, respectively, to said first and second drive sprocket wheels.

40. A drive wheel assembly according to claim 38 wherein said unit includes connecting means for directly and drivingly connecting the unit to the drive axle shaft 15 of a track unit.

41. A drive wheel assembly according to claim 39 wherein said unit includes connecting means for directly and drivingly connecting the unit to the drive axle shaft of a track unit.

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42. A drive wheel assembly according to claim 38 wherein said drive cogs of each drive sprocket wheel extend laterally inwardly and outwardly from said wheel, the laterally inwardly extending portions of said cogs having a greater length than the laterally outwardly extending portions thereof.

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43. A drive wheel assembly according to claim 38 wherein said drive cogs of each drive sprocket wheel include laterally inwardly extending cog portions, the laterally inwardly extending cog portions of said first and second sprocket wheels being

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laterally aligned and terminating at outer ends adjacent to one another such that said aligned cog portions together can engage the full width of a drive lug extending between said sprocket wheels.

5 44. A guide wheel assembly for supporting an endless drive track of a drive track unit for an all-terrain vehicle, said guide wheel assembly comprising:

 a wheel spindle adapted for fixed attachment to a frame portion of a drive track unit;

10 a first guide wheel unit rotatably mounted to one end portion of said wheel spindle;

 a second guide wheel unit rotatably mounted to an opposite end portion of said wheel spindle in spaced apart relationship to said first guide wheel unit; and

15 at least one of said guide wheel units including continuous annular first and second guide wheel surface portions for engaging a drive track, said first and second surface portions being axially spaced-apart to define an annular groove therebetween sized for receiving and allowing passage of drive lugs of a drive track therethrough.

20 45. A guide wheel assembly according to claim 44 wherein one of said guide wheel surface portions is substantially wider than the other of said guide wheel surface portions.

25 46. A guide wheel assembly according to claim 44 wherein the axially outermost guide wheel surface portion of a guide wheel unit is substantially wider than the axially innermost guide wheel surface portion of said unit.

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 A guide wheel assembly according to claim 44 wherein the total width of said assembly approximates the total width of a drive track for which it is intended to be used.

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48. A guide wheel assembly according to claim 44 wherein each guide wheel unit of the guide wheel assembly includes said first and second guide wheel surface portions, and the annular groove of each guide wheel unit is sized to allow a
5 row of drive lugs on the inner surface of a drive track to pass between said first and second guide wheel surface portions.

49. A guide wheel assembly according to claim 48 wherein the first and second guide wheel units are axially spaced apart along said wheel spindle a sufficient
10 distance to allow at least one row of drive lugs on the inner surface of a drive track to pass therebetween.

50. A guide wheel assembly according to claim 49 wherein said guide wheel units are axially spaced apart along said wheel spindle a sufficient distance to allow a
15 carrier beam of a drive track unit frame to extend between said first and second guide wheel units when the wheel spindle is mounted to the frame.

51. A guide wheel assembly according to claim 44 wherein one of said guide wheel surface portions of a guide wheel unit is at least twice as wide as the other guide
20 wheel surface portion of said unit.

52. A guide wheel assembly according to claim 44 wherein one of said guide wheel surface portions of a guide wheel unit is at least three times the width of the other guide wheel surface portion of said unit.

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53. A guide wheel assembly according to claim 44 wherein one of the guide wheel surface portions is at least four times as wide as the other guide wheel surface portion of said unit.

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54. A guide wheel assembly according to claim 46 wherein said outermost
guide wheel surface portion of each guide wheel unit terminates outwardly at the
laterally outer end portion of the guide wheel unit and the innermost guide wheel
5 surface portion terminates inwardly at the innermost end portion of the guide wheel
unit.

55. A guide wheel assembly according to claim 44 wherein said first and
second guide wheel units are identical to one another.

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56. A guide wheel assembly according to claim 44 wherein said guide wheel
assembly includes only said first and second guide wheel units, said guide wheel units
being identical, said first and second surface portions of each said unit including a wide
outermost surface portion and a substantially narrower innermost surface position, the
15 spacing between said units being sized to permit drive lugs on an inner surface of a
drive track to pass therebetween, and the total width of the drive wheel assembly
approximating the total width of a drive track for which the assembly is intended to be
used.

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57. A track-driven all-terrain vehicle comprising:
a vehicle body portion;
multiple drive track units supporting the body portion;
each of said drive track units including:
a track frame, including a carrier beam extending longitudinally of said vehicle;
25 a powered rotatable track drive wheel assembly supported on said frame;
plural guide wheel assemblies mounted on said carrier beam and in spaced apart
relationship along said beam;

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an endless track trained about said drive wheel assembly and said guide wheel assemblies and being drivingly engaged by said drive wheel assembly and supported during ground engagement by said guide wheel assemblies;

each said guide wheel assembly including a wheel spindle fixedly mounted to
5 said carrier beam and extending laterally inwardly and outwardly beyond said carrier beam, an outer guide wheel unit rotatably mounted on an outwardly extending portion of said wheel spindle, and an inner guide wheel unit rotatably mounted on an inwardly extending portion of said wheel spindle such that said outer and inner guide wheel units are axially spaced apart on opposite sides of the carrier beam and define the width of
10 said assembly.

58. The vehicle of claim 57 wherein each said guide wheel assembly extends substantially the full width of said endless track.

15 59. The vehicle of claim 57 wherein the width of each said guide wheel assembly is substantially equal to and coextensive with the width of said drive track.

60. The vehicle of claim 57 wherein said drive track is a drive belt having laterally spaced-apart and circumferentially extending rows of drive lugs extending
20 inwardly from an inner surface of said belt, said drive wheel assembly including drive cogs for drivingly engaging the rows of drive lugs, and said inner and outer guide wheel units of said guide wheel assemblies each including outer track support surfaces that support substantially the full width of said track except where said rows of drive lugs are positioned.

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61. The vehicle of claim 57 wherein said outer guide wheel unit of said guide wheel assembly supports an outer edge portion of said drive track.

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62. The vehicle of claim 57 wherein said inner guide wheel unit of said guide wheel assembly supports an inner edge portion of said drive track.

63. The vehicle of claim 57 wherein said multiple drive track units comprise
5 four said units.

64. The vehicle of claim 63 wherein aid drive wheel assembly and said guide wheel assemblies of each drive track unit support said endless track in a generally triangular configuration with said drive wheel assembly at the apex of said
10 configuration and said guide wheel assemblies spaced apart along the base of said configuration.

65. The vehicle of claim 64 wherein the width of each said guide wheel assembly is substantially equal to and coextensive with the width of said drive track.
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66. The vehicle of claim 64 wherein said drive track is a drive belt including an inner surface having multiple circumferentially extending rows of drive lugs extending inwardly therefrom, and said drive wheel assembly includes multiple spaced-apart sprocket wheels including laterally extending drive cogs for drivingly engaging
20 the said rows of drive lugs.

67. The vehicle of claim 66 wherein said drive belt includes a smooth outer ground-engaging surface.

68. The vehicle of claim 66 wherein each of said inner and outer guide wheel units of each guide wheel assembly is provided with an annular belt-engaging surface and an annular groove sized to permit passage therethrough of one of said rows of lugs and to maintain lateral alignment of said belt with said guide wheel assemblies.
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69. The vehicle of claim 66 wherein said guide wheel assemblies and said drive belt are substantially coextensive in width.

5 70. The vehicle of claim 66 wherein said drive belt extends outwardly of the laterally outer limits of said guide wheel assemblies.

10 71. The vehicle of claim 66 wherein said multiple rows of drive lugs include a single row of drive lugs positioned between said inner and outer guide wheel units of said guide wheel assemblies, the width of the lugs of said single row being substantially coextensive with the spacing between said inner and outer wheel units.

72. The vehicle of claim 71 wherein said drive cogs include cog portions that drivingly engage substantially the full width of the lugs of said single row.